

HNF-9921  
Revision 0  
(Formerly HNF-SD-EN-WAP-005)

# T Plant Complex Waste Analysis Plan

Prepared for the U.S. Department of Energy  
Assistant Secretary for Environmental Management  
Project Hanford Management Contractor for the  
U.S. Department of Energy under Contract DE-AC06-96RL13200  
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Richland, Washington

**RECORD COPY**

Approved for public release; further dissemination unlimited

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## GLOSSARY

1		
2		
3		
4	AOAC	Association of Official Analytical Chemists
5	APHA	American Public Health Association
6	ASTM	American Society for Testing and Materials
7		
8	CAP	corrective action plan
9	CCW	constituent concentration in waste
10	CCWE	constituent concentration in waste extracts
11	CFR	Code of Federal Regulations
12	COLIWASA	composite liquid waste sampler
13	CWC	Central Waste Complex
14		
15	DST	double-shell tank
16		
17	Ecology	Washington State Department of Ecology
18	EPA	U.S. Environmental Protection Agency
19	ETF	200 Area Effluent Treatment Facility
20		
21	LDR	land disposal restriction
22	LERF	Liquid Effluent Retention Facility
23	LLBG	Low-Level Burial Grounds
24		
25	NDE	nondestructive examination
26		
27	PCB	polychlorinated biphenyl
28	PES	Performance Evaluation System
29	PPE	personal protective equipment
30		
31	QA	quality assurance
32	QC	quality control
33		
34	RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
35	RCW	Revised Code of Washington
36		
37	SWITS	Solid Waste Information Tracking System
38		
39	T Plant	T Plant Complex
40	TCLP	toxicity characteristics leaching procedure
41	TRU	transuranic
42	TSCA	<i>Toxic Substances Control Act of 1976</i>
43	TSD	treatment, storage, and/or disposal
44		
45	WAC	Washington Administrative Code
46	WAP	waste analysis plan
47	WRAP	Waste Receiving and Processing Facility
48		

## METRIC CONVERSION CHART

Into metric units

Out of metric units

If you know	Multiply by	To get	If you know	Multiply by	To get
<b>Length</b>			<b>Length</b>		
inches	25.40	millimeters	millimeters	0.03937	inches
inches	2.54	centimeters	centimeters	0.393701	inches
feet	0.3048	meters	meters	3.28084	feet
yards	0.9144	meters	meters	1.0936	yards
miles (statute)	1.60934	kilometers	kilometers	0.62137	miles (statute)
<b>Area</b>			<b>Area</b>		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.09290304	square meters	square meters	10.7639	square feet
square yards	0.8361274	square meters	square meters	1.19599	square yards
square miles	2.59	square kilometers	square kilometers	0.386102	square miles
acres	0.404687	hectares	hectares	2.47104	acres
<b>Mass (weight)</b>			<b>Mass (weight)</b>		
ounces (avoir)	28.34952	grams	grams	0.035274	ounces (avoir)
pounds	0.45359237	kilograms	kilograms	2.204623	pounds (avoir)
tons (short)	0.9071847	tons (metric)	tons (metric)	1.1023	tons (short)
<b>Volume</b>			<b>Volume</b>		
ounces (U.S., liquid)	29.57353	milliliters	milliliters	0.033814	ounces (U.S., liquid)
quarts (U.S., liquid)	0.9463529	liters	liters	1.0567	quarts (U.S., liquid)
gallons (U.S., liquid)	3.7854	liters	liters	0.26417	gallons (U.S., liquid)
cubic feet	0.02831685	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.7645549	cubic meters	cubic meters	1.308	cubic yards
<b>Temperature</b>			<b>Temperature</b>		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit
<b>Energy</b>			<b>Energy</b>		
kilowatt hour	3,412	British thermal unit	British thermal unit	0.000293	kilowatt hour
kilowatt	0.94782	British thermal unit per second	British thermal unit per second	1.055	kilowatt
<b>Force/Pressure</b>			<b>Force/Pressure</b>		
pounds (force) per square inch	6.894757	kilopascals	kilopascals	0.14504	pounds per square inch

06/2001

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Third Ed., 1990, Professional Publications, Inc., Belmont, California.

## T PLANT COMPLEX WASTE ANALYSIS PLAN

### 1.0 INTRODUCTION

The purpose of this waste analysis plan (WAP) is to document the waste acceptance process, sampling methodologies, analytical techniques, and overall processes that are undertaken for treatment and/or storage of dangerous and mixed waste managed at the T Plant Complex (T Plant), a treatment, storage, and/or disposal (TSD) unit. T Plant is located in the 200 West Area of the Hanford Facility, Richland, Washington (Figure 1-1). Because dangerous waste does not include the source, special nuclear, and by-product material components of mixed waste, radionuclides are not within the scope of this documentation. The information on radionuclides is provided only for general knowledge. The term 'TSD unit' is used throughout this WAP to refer to T Plant. Activities could be performed by the T Plant operating organization or its delegated representative.

#### 1.1 DESCRIPTION OF UNIT PROCESSES AND ACTIVITIES

T Plant was constructed in 1943 and began waste management operations in January of 1957. T Plant consists of two main structures, 221-T Building (221-T) and the 2706-T/2706-TA Buildings (2706-T), and various support structures and units. Figure 1-2 provides a site plan.

Treatment of containerized and non-containerized dangerous and/or mixed waste could take place in the 221-T canyon, 221-T railroad tunnel, 2706-T Building, 214-T storage building, and in other support area and treatment/storage units located within the TSD unit boundary. Modular buildings also could be set up within the T Plant TSD unit boundary for treatment and/or storage of waste. Types of treatments that could be implemented include those identified in Washington Administrative Code (WAC) 173-303-380, "Dangerous Waste Regulations", and described in the *Hanford Facility Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste* (Hanford Facility RCRA Permit), T Plant, Chapter 4.0 (Permit No. WA7890008967).

A variety of technologies are emerging for treating dangerous and/or mixed waste, minimizing waste generation, and achieving compliance with land disposal restrictions (LDR) [40 Code of Federal Regulations (CFR) 268] (refer to this document, Sections 2.1.3.2 and 7.4). Many of these technologies could lend themselves to application at T Plant or to operations similar to those conducted at T Plant. This TSD unit can serve as a major asset for technology demonstration because T Plant offers a high degree of flexibility to test and implement technologies under safe, controlled conditions. T Plant operations are adequate for, or readily adaptable to, testing and implementing many of these technologies. The process presented in the Hanford Facility RCRA Permit, T Plant, Chapter 4.0, describes how technologies are tested and how successful technologies could be implemented.

In addition to treatment, this TSD unit also processes dangerous and/or mixed waste in the 221-T canyon, 221-T railroad tunnel, 2706-T Building, 214-T storage building, and in other support area structures and treatment/storage units. Types of processing could include, but are not limited to, sorting, inspection, sampling, and repackaging. Processing capability at T Plant is required to (1) complete laboratory analysis and/or characterization before transferring the waste to another approved onsite TSD unit or offsite TSD facility; (2) perform verification activities; and/or (3) sort, segregate, treat, or repackage mixed waste to meet onsite TSD unit or offsite TSD facility waste acceptance criteria.

T Plant also performs decontamination activities using a variety of technologies. Equipment and other components (e.g., tools, railroad equipment, buses, trucks, automobiles, cranes, earth-moving equipment,

and other large and small pieces of process equipment) are decontaminated in the 2706-T Building, 221-T canyon, and other support structures. Decontamination technologies include, but are not limited to, immersion treatment; spray batch treatment; and steam, water, ice, carbon dioxide, chemical, or abrasive blasting. Liquid mixed waste generated from various decontamination and/or treatment processes is collected and transferred to the 2706-T Building tank system. This waste is transferred to an onsite TSD unit capable of accepting this waste.

Future missions for this TSD unit include the storage and/or processing of K Basin sludge, transuranic (TRU) waste, and high-level waste.

## 1.2 IDENTIFICATION, CLASSIFICATION, AND QUANTITIES OF DANGEROUS WASTE GENERATED OR MANAGED AT T PLANT

Waste is accepted for treatment (mixed waste) and/or storage (mixed and dangerous) except for the following waste types:

- Explosive waste
- Shock sensitive waste
- Class IV oxidizer waste
- Infectious waste.

This TSD unit manages, but is not limited to managing, the following waste types:

- Labpack liquids
- Solids/debris
- Sludges/soils
- Bulk liquids in tanker trucks and container(s)
- Bulk solids/debris/sludges in trucks and roll-off boxes.

These waste types could be classified as TRU, TRU-mixed, low-level, mixed, and/or dangerous. The Hanford Facility RCRA Permit, T Plant, Chapter 1.0, identifies dangerous waste numbers, quantities, and design capacity. Dangerous and/or mixed waste with dangerous waste numbers not identified in Chapter 1.0 are not managed at this TSD unit until the Part A, Form 3, is modified. T Plant also can manage *Toxic Substances Control Act* (TSCA) of 1976 polychlorinated biphenyl (PCB) waste [40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions"]. T Plant has the capability to receive ignitable, reactive, and incompatible waste (refer to Section 7.0 and the Hanford Facility RCRA Permit, T Plant, Chapter 4.0, for special process requirements when managing this waste).

## 1.3 MANAGEMENT OF WASTE

Dangerous and mixed waste is accepted at T Plant for treatment and storage. Additionally, dangerous and mixed waste is generated during normal T Plant operations.

The onsite generating units, onsite TSD units, and offsite generators transferring/shipping waste to this TSD unit hereafter are referred to as the 'generator' unless otherwise denoted in this WAP. T Plant accepts dangerous and mixed waste from other onsite solid waste project TSD units [i.e., Central Waste Complex (CWC), Waste Receiving and Processing (WRAP) Facility, and Low-Level Burial Grounds (LLBG)] and onsite generating units and offsite generators. The differences in the waste acceptance

process for transfers from onsite solid waste project TSD units (Figure 1-3) and onsite generating units/offsite generators (Figure 1-4) are discussed in detail in Section 2.0.

The TSD unit maintains written waste tracking procedures to ensure that the waste received at the TSD unit matches the manifests or transfer papers, to ensure that the waste is tracked through the TSD unit to final disposition, and to maintain the information required in WAC 173-303-380. Waste is tracked through such processes as segregation, repackaging, treatment, and/or intra-TSD unit transfers. The waste tracking process (Figure 1-5) provides a mechanism to track waste through a uniquely identified container. The unique identifier is a barcode (or equivalent) that is recorded in the solid waste information tracking system. This mechanism encompasses the waste acceptance process, the movement of waste, the processing of waste, and management of the waste. If necessary, new container identification numbers are assigned and maintained as the waste moves through the TSD unit. The container identification number allows the TSD unit to link to hard copy records that are maintained as part of the operating record to maintain information on the location, quantity, and physical and chemical characteristics of the waste. Field screening and sampling are performed in accordance with this WAP and occur at the point of waste generation, where the waste materials are stored, or another appropriate location.

The following sections describe the process for waste acceptance and the different types of information and knowledge reviewed/required during the acceptance process. The process for management of waste is described in the Hanford Facility RCRA Permit, T Plant, Chapter 4.0.

### 1.3.1 Waste Generated Within T Plant

This TSD unit generates dangerous and mixed waste as a result of normal operational activities. These activities include treatment, storage, and transfer functions along with inspection, sampling, decontamination, cleanup, maintenance, repackaging, and size reduction tasks. This waste material consists of such items as personal protective equipment (PPE), rags, spent equipment contaminated with dangerous cleaning agents, lubricants, paints, or other dangerous materials. Process knowledge, field screening, and/or sampling and analysis are used, as appropriate, to characterize these waste materials.

### 1.3.2 Waste Acceptance Process for Newly Generated Waste

The TSD unit acceptance process for containerized waste consists of the following activities.

- Waste Stream Approval. The onsite generating unit/offsite generator provides information concerning each waste stream on a waste profile sheet. The waste stream information is reviewed against the TSD unit waste acceptance criteria. If the waste stream information is sufficient and meets the applicable waste acceptance criteria, the waste stream is approved. In addition, the initial verification frequency for the waste is determined in accordance with the requirements found in the Performance Evaluation System (PES) (Section 2.3). For a more complete description of the waste stream approval process, refer to Section 2.1.1.
- Waste Transfer/Shipment Approval. The onsite generating unit/offsite generator provides specific data for each waste. The container data are reviewed against the waste profile sheet data and the TSD unit waste acceptance criteria before being approved for transfer/shipment. In addition, the TSD unit determines if any of the containers require verification based on the verification frequency as determined by the PES. For a more complete description of the waste transfer/shipment approval process, refer to Section 2.1.2.

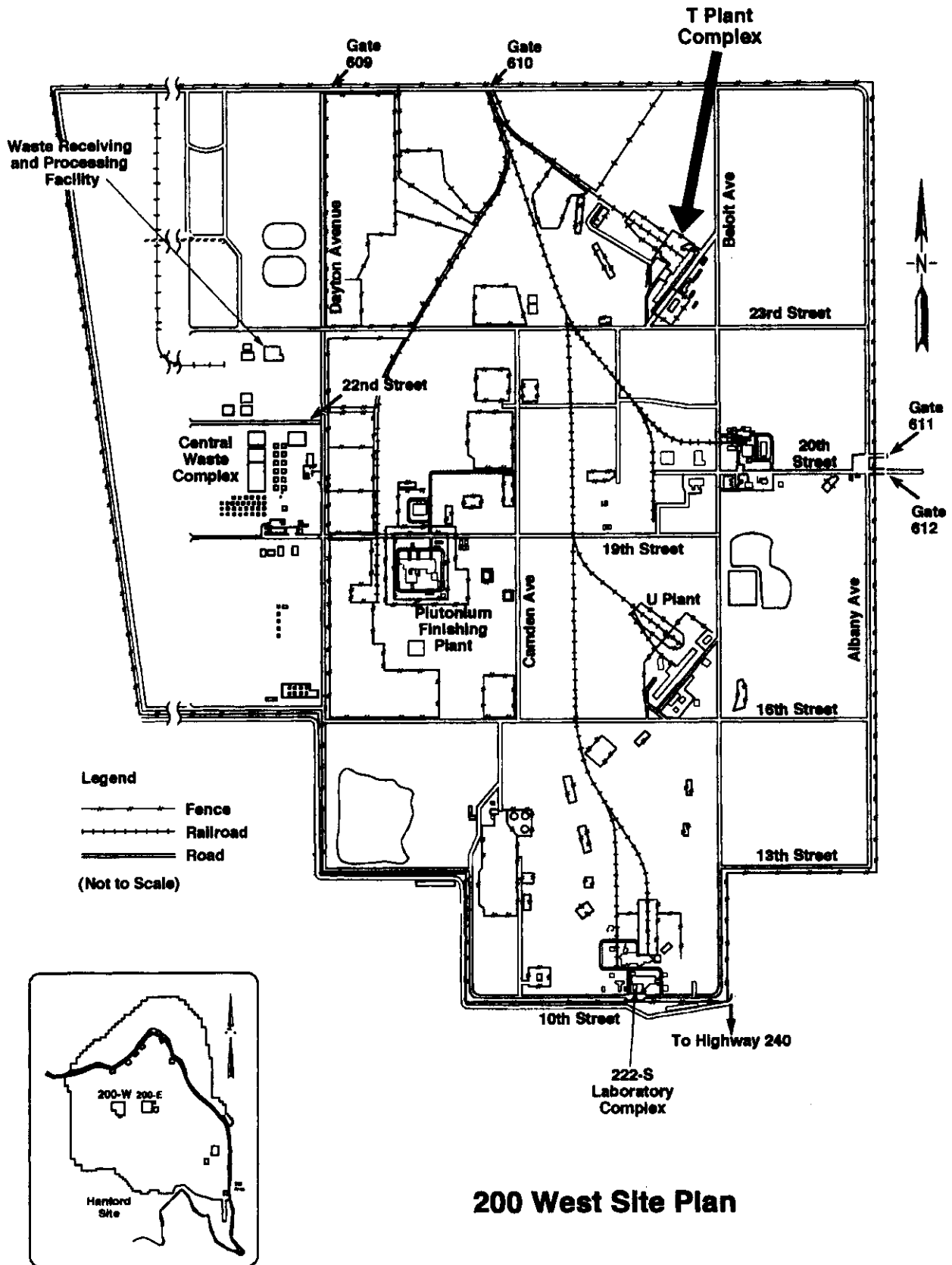
- **Verification.** All waste transfers/shipments are subject to receipt inspection during the waste acceptance process. The percentage of the waste transfer/shipment selected for physical and/or chemical screening is determined in accordance with the requirements found in the PES (Section 2.4). Containers are opened and verified visually or by nondestructive examination (NDE). Of those containers subjected to physical screening, a percentage of containers is subject to chemical screening via field or laboratory analysis. All information and data are evaluated to confirm that the waste matches the waste profile and container data/information supplied by the onsite generating unit/offsite generator. For a more complete description of the verification process, refer to Section 2.2.

### **1.3.3 Waste Acceptance Process for Transfers Among Solid Waste Project TSD Units**

Waste transfers from CWC, WRAP, or LLBG TSD units to this TSD unit could be necessary to support Hanford Site goals. In these instances, a waste stream profile already developed and approved for one of the mentioned TSD units could be used. A technical review for container transfers is performed to confirm that the waste meets the TSD unit waste acceptance criteria. All waste transfers are subject to receipt inspection. For waste that has not been accepted at CWC, WRAP, LLBG, or T Plant, physical and/or chemical screening is completed as described in Sections 3.1 and 3.2. All information and data are evaluated to confirm that the waste matches the container data information. For a more complete description of the transfer process, refer to Section 2.3.

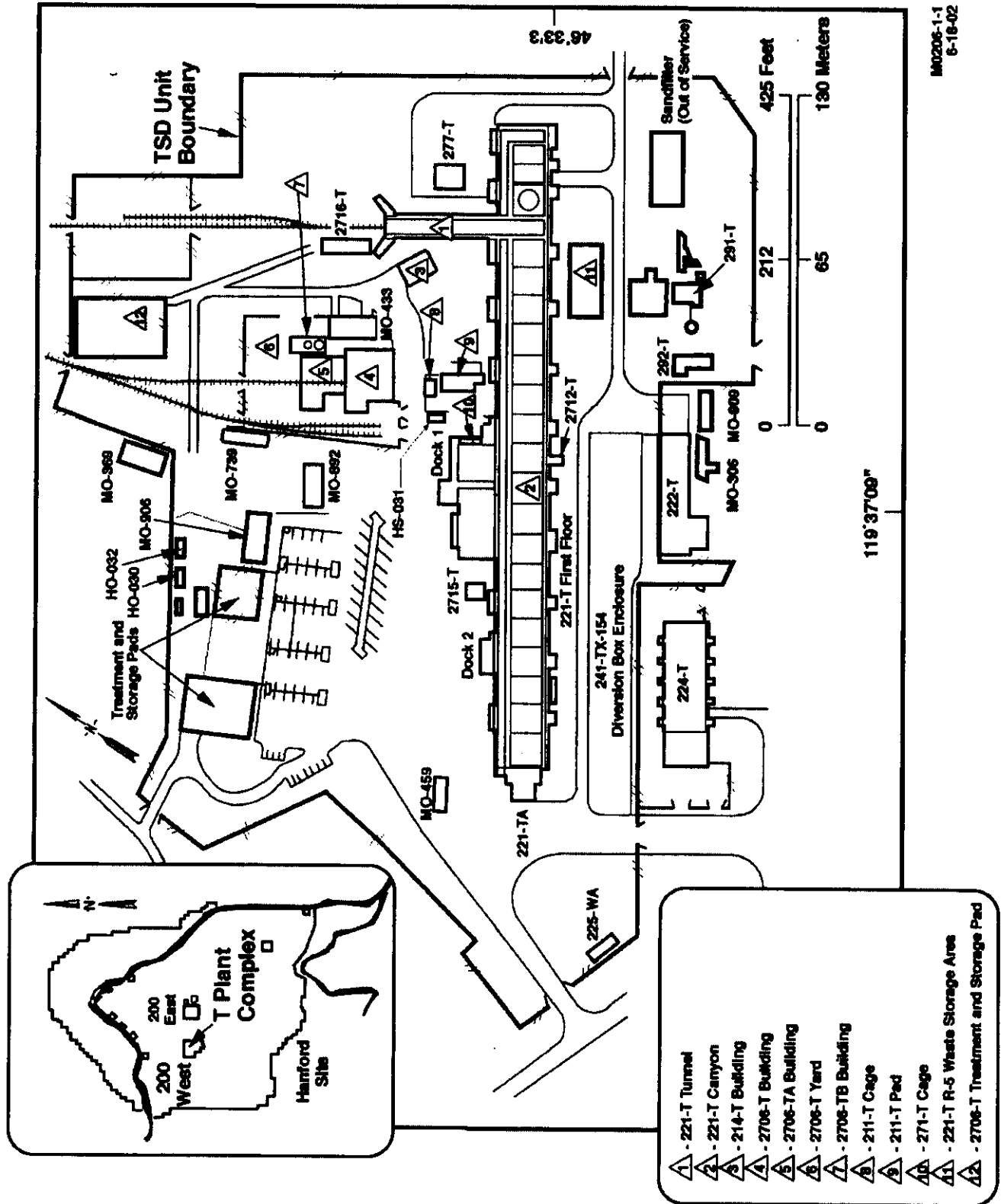
### **1.3.4 Waste Acceptance Process for 2706-T Tank System**

Liquid waste is managed at T Plant in the 2706-T, 2706-TA, and 2706-TB Buildings. The acceptance process consists of waste profile development, approval, and confirmation before acceptance and management at T Plant. All waste profiles are reviewed for chemical compatibility with the tank contents and equipment. Section 2.5 provides a complete description of the acceptance process.



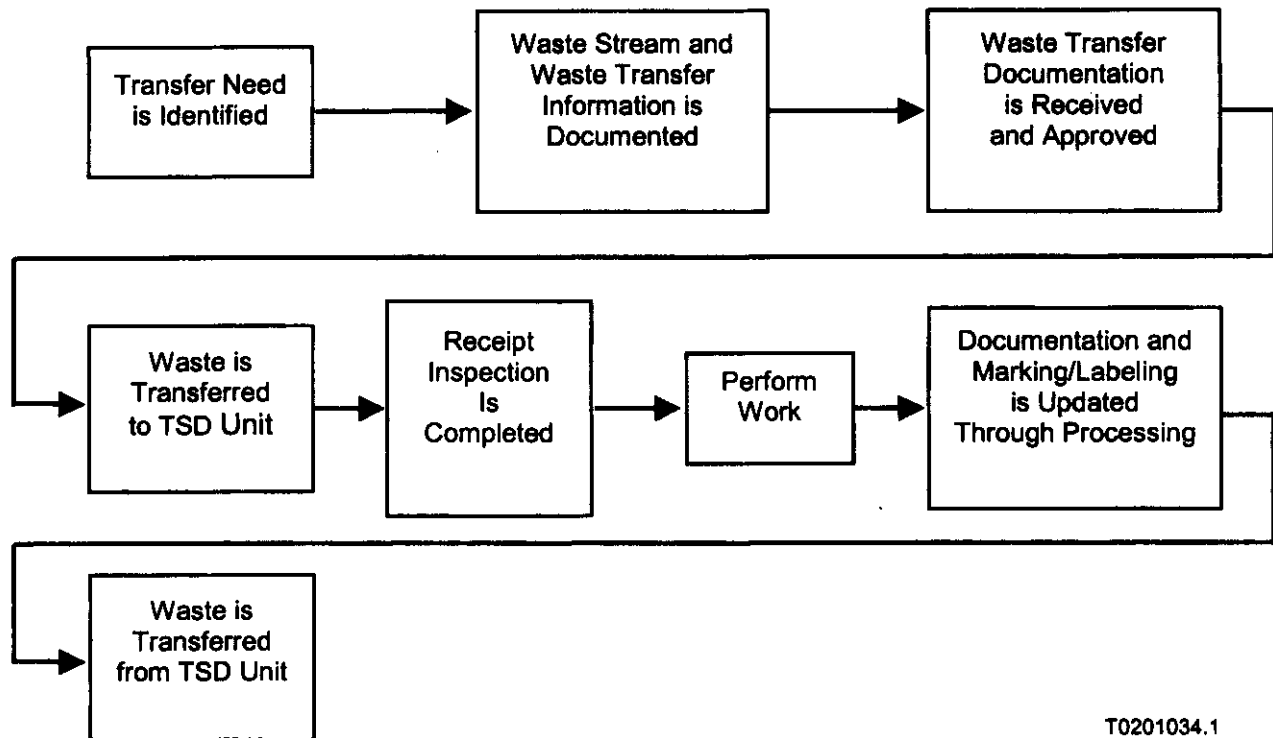
H99020236.2R1

Figure 1-1. 200 West Area Site Plan.



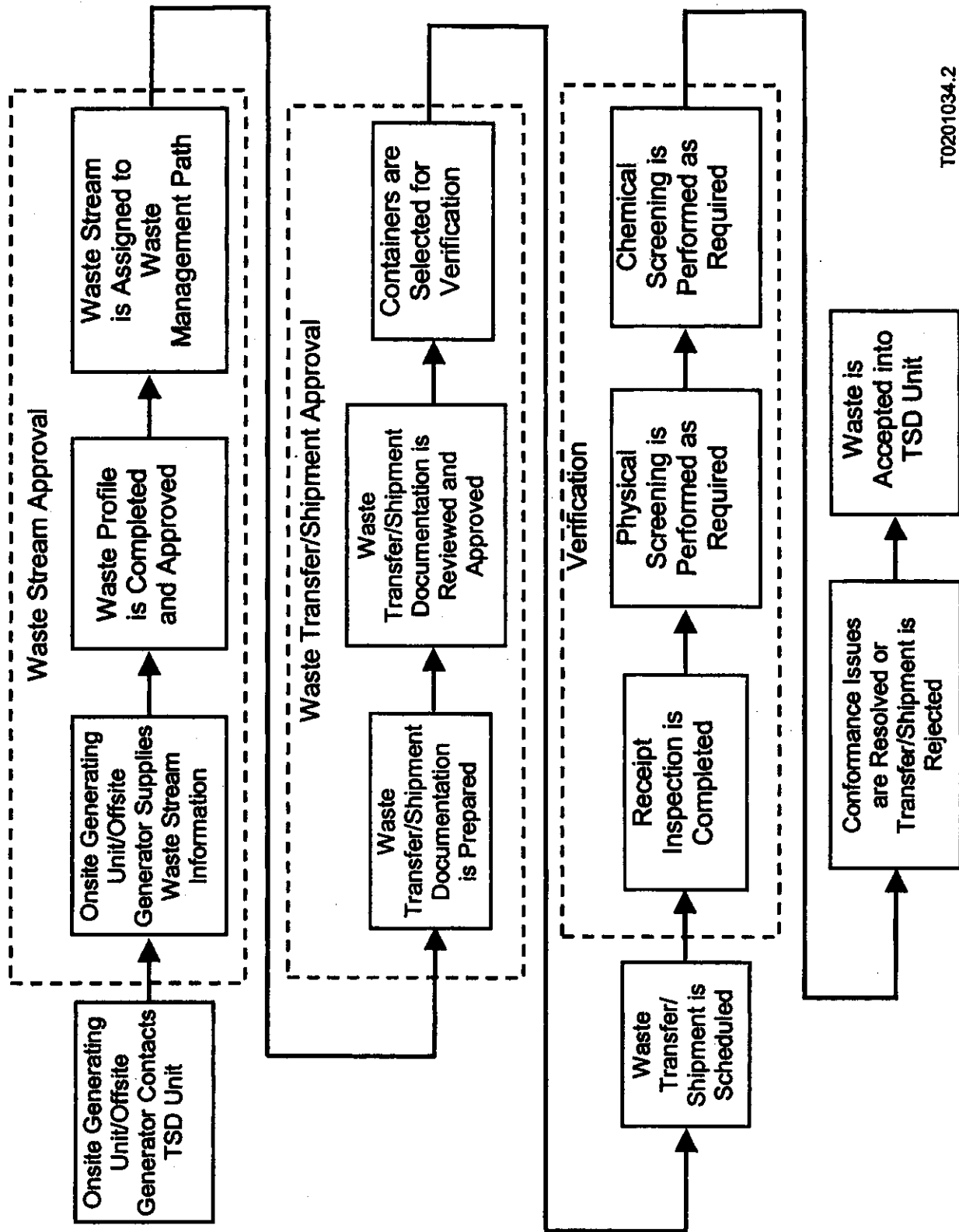
MO2006-1-1  
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Figure 1-2. T Plant Complex Site Plan.



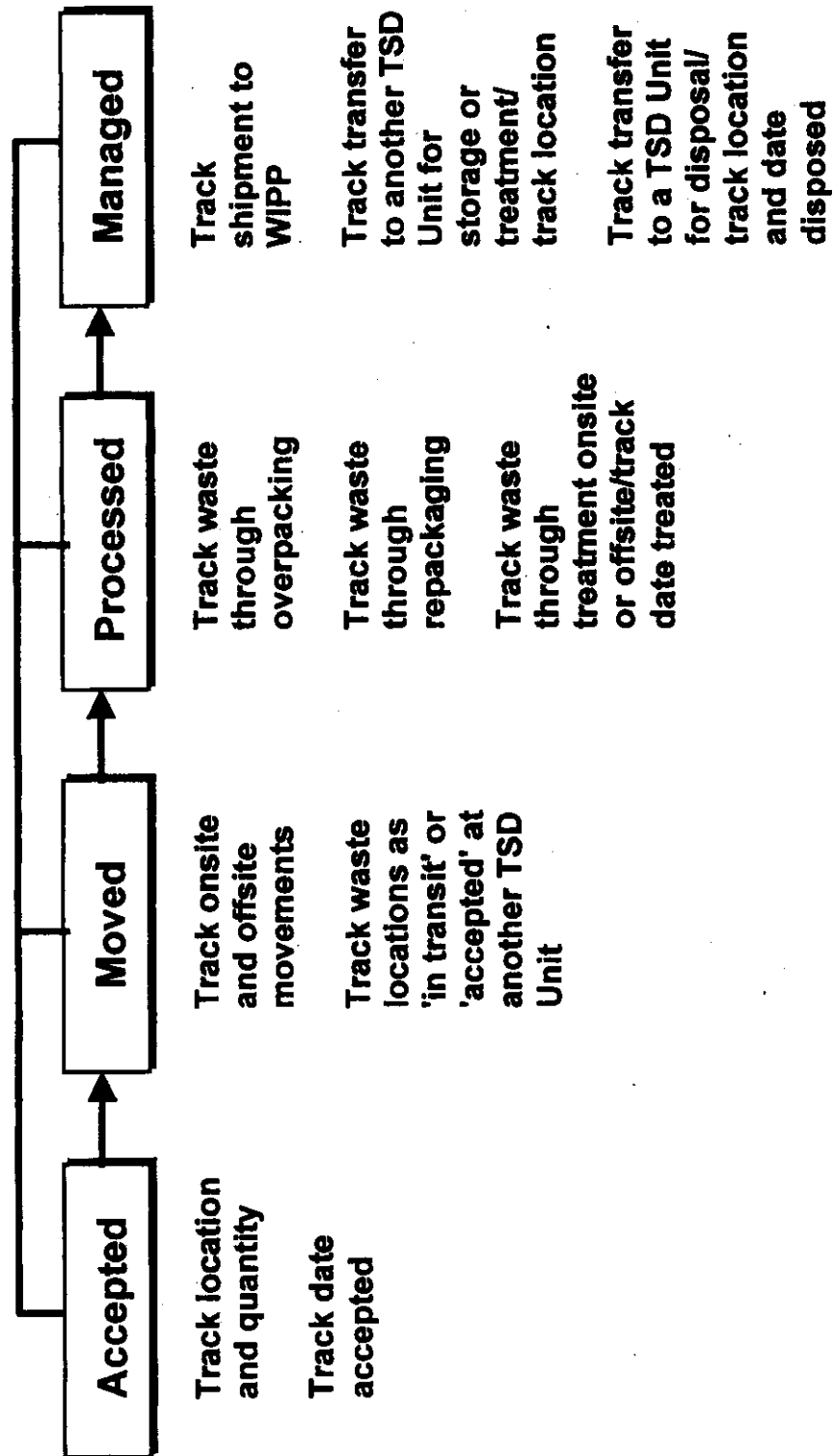
T0201034.1

Figure 1-3. Waste Transfers Among Solid Waste Project TSD Units.



T0201034.2

Figure 1-4. Waste Confirmation and Acceptance Process for Newly Generated Waste.



WIPP = Waste Isolation Pilot Plant.

Figure 1-5. Waste Tracking.

APPENDIX M  
HNF-9921

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## 2.0 CONFIRMATION PROCESS

WAC 173-303-300(1) requires confirmation on mixed and/or dangerous waste before acceptance of waste into a waste management unit. Confirmation is not required for transfer of waste within T Plant waste management units. The confirmation process consists of two parts, pre-transfer/shipment review and verification. Confirmation activities are performed in accordance with TSD unit-specific governing documentation. Differences in the confirmation process for liquid waste generated at T Plant and onsite generating unit/offsite generator waste acceptance and transfers from other solid waste project TSD units are discussed. T Plant performs an integrated technical review to ensure acceptance of waste streams or transfers of waste. The confirmation process is detailed in Figure 2-1.

### 2.1 PRE-TRANSFER/SHIPMENT REVIEW

Pre-transfer/shipment review takes place before waste can be scheduled for transfer or shipment to this TSD unit. The review focuses on whether the waste stream is defined accurately, meets the TSD unit waste acceptance criteria, and the LDR status is determined correctly. Only waste determined to be acceptable for treatment and/or storage is scheduled. This determination is based on the information provided by the generator. The pre-transfer/shipment review consists of the waste stream approval and waste transfer/shipment approval process. Waste being transferred from one solid waste project TSD unit to another is discussed in Section 2.3. The following sections discuss the pre-transfer/shipment review process. The information obtained during the pre-transfer/shipment review, at a minimum, includes all information necessary to safely treat and/or store the waste. The pre-transfer/shipment review ensures that the waste has been characterized and the data provided qualify as 'acceptable knowledge' (Section 2.1.3).

#### 2.1.1 Waste Stream Approval Process

The waste stream approval process consists of reviewing stream information supplied on a waste stream profile and supporting documentation, which could consist of container drawings, process flow information, analytical data, etc. The waste stream profile requires the following supporting documentation:

- Generator information (e.g., name, address, point-of-contact, telephone number)
- Waste stream name
- Waste generating process description
- Chemical characterization information [e.g., characterization method(s), chemicals present, concentration ranges]
- Designation information
- LDR information, including identification of underlying hazardous constituents if applicable
- Waste type information (e.g., physical state, sorbents used, inert materials, stabilizing agents used)
- Packaging information (e.g., container type, maximum weight, size).

When applicable, detailed information is gathered during the waste transfer/shipment approval process. This information is reviewed against the TSD unit waste acceptance criteria to ensure the waste is acceptable for receipt. If conformance issues are found during this review, additional information is requested that could include analytical data or the collection of a sample to be analyzed. If the waste cannot be received, the TSD unit pursues acceptance of the waste at an alternative onsite TSD unit or requests the generator to pursue acceptance at an offsite facility.

The TSD unit assigns the waste stream profile to a waste management path (waste specification record), and establishes a waste verification frequency based on the process outlined in Section 2.4 when the waste is determined to be acceptable.

For liquid waste, an integrated technical review is made of the information contained on the waste profile sheet to ensure the waste is compatible with current system contents, tank and ancillary equipment materials, and in compliance with the acceptance criteria.

#### **2.1.2 Waste Transfer/Shipment Approval Process**

The process described here primarily applies to containerized waste. Section 2.1.4 provides additional requirements for management of liquid waste. For each waste transfer or shipment that is a candidate for treatment and/or storage, the onsite generating unit/offsite generator generally provides the following information:

- Container identification number
- Profile number (except for waste transfers/shipments of previously accepted waste)
- Waste description
- Generating unit/generator information (e.g., name, address, point-of-contact, telephone number)
- Container information (e.g., type, size, weight)
- Waste numbers
- Extremely hazardous waste or dangerous waste
- Waste composition
- Packaging materials and quantities.

The pertinent information is entered into a solid waste information system.

Where potential conformance issues exist in the information provided (i.e., waste characteristics do not match the waste profile information or TSD unit waste acceptance criteria, or additional constituents are expected to be present that do not appear on the documentation), the onsite generating unit/offsite generator is contacted by the TSD unit for resolution. Section 6.0 provides discussion on repeat and review frequency.

For each container, a technical review, physical screening determination, and chemical screening determination are performed. Individual container data are compared to the waste profile data to ensure the waste is as described on the waste profile. Screening provides a means to minimize the potential for acceptance of incorrectly identified waste.

- **Technical review.** Every transfer or shipment is reviewed to ensure the waste meets the TSD unit waste acceptance criteria. Based on waste identification information provided, the waste designation is reviewed to ensure consistency with waste designations per WAC 173-303-070, as well as for technical accuracy to ensure the waste meets the T Plant waste acceptance criteria.

If the transfer or shipment information is found to be acceptable, the TSD unit determines if any of the waste containers are required to be physically or chemically screened.

- **Physical and chemical screening determination.** Written procedures are maintained describing the process for selecting containers for chemical screening. Authoritative/directive means of selecting containers for physical/chemical screening are used based on the pre-transfer/shipment review process. The selection is based on the contents listed in the associated transfer/shipment documentation, the variation within the transfer/shipment, and experience with the specific waste type.

Two criteria are used in making the selection. The first criterion is based on whether pre-transfer/shipment review activities (document and characterization review) identify areas of potential concern. The second criterion is reviewing the current physical screening percentage (calculated using the following method) of containers received from said stream from said generator that have been received over the past 12 months or the date of the last physical screening adjustment, whichever occurs first. The rate is applied as compared to those that physically have been screened. This criterion ensures that the minimum physical screening confirmation rates required by this WAP are met.

The number of containers selected for physical screening in transfer/shipments is determined by multiplying the total number of containers received during the previous 12 months for that stream including the containers identified in the transfer/shipment by the applicable verification percentage, rounded up to the next integer. This selected group of containers constitutes a sample set.

### **2.1.3 Acceptable Knowledge Requirements**

The TSD unit ensures that all information used to make waste management decisions is based on characterization data as described in the following sections. For information determined to be 'acceptable knowledge', the TSD unit determines that the information is adequate for management of the waste.

#### **2.1.3.1 General Acceptable Knowledge Requirements**

When collecting documentation on a waste stream or container, the TSD unit determines if the information provided is acceptable knowledge. Acceptable knowledge requirements are met by either sampling and analysis or process knowledge. Process knowledge consists of using detailed information from existing published or documented waste analysis data or studies on processes similar to those that generated the waste, including, but not limited to, the following:

- Mass balance from a controlled process that has a specified input for a specified output
- Material safety data sheets (MSDSs) on unused chemical products
- Test data from a surrogate sample
- Analytical data on the waste or a waste from a similar process
- Interview information
- Logbooks
- Procurement records
- Qualified analytical data
- Radiation work package
- Procedures and/or methods

- 1 • Process flow charts
- 2 • Inventory sheets.

3  
4 If the information is sufficient to quantify the constituents of regulatory concern and to determine waste  
5 characteristics as required by the regulations and TSD unit waste acceptance criteria, the information is  
6 considered acceptable knowledge. Adequate acceptable knowledge includes (1) general waste knowledge  
7 requirements, (2) LDR waste knowledge requirements, and/or (3) waste knowledge exceptions.

- 8  
9 **(1) General waste knowledge requirements.** At a minimum, the onsite generating unit/offsite  
10 generator supplies enough information for the waste to be treated and/or stored at this TSD unit. The  
11 minimum level of acceptable knowledge consists of designation data where the constituents causing  
12 a dangerous waste number to be assigned are quantified and that data address any T Plant operational  
13 parameters necessary for proper management of the waste.

14  
15 When process knowledge indicates that constituents, which if present in the waste might cause the  
16 waste to be regulated, are input to a process but not expected to be in the waste, sampling and  
17 analysis must be performed to ensure the constituents do not appear in the waste above applicable  
18 regulatory levels. This requirement can be met through chemical screening. Sampling and analysis  
19 are required only for initial characterization of the waste stream.

20  
21 When the available information does not qualify as acceptable knowledge or is not sufficient to  
22 characterize a waste for management, the sampling and testing methods outlined in  
23 WAC 173-303-110 are used to determine whether a waste designates as ignitable, corrosive,  
24 reactive, and/or toxic and whether the waste contains free liquids as applicable. If analysis is  
25 performed to complete characterization after acceptance of the waste by the TSD unit, this WAP  
26 governs the sampling and testing requirements.

- 27  
28 **(2) LDR waste knowledge.** Waste might be stored in this TSD unit while awaiting analytical results for  
29 LDR requirements. The T Plant operating record contains all information required to document that  
30 the appropriate treatment standards have been met or will be met after the waste is treated unless  
31 otherwise excepted in this section.

32  
33 For the purposes of this WAP, a representative sample is required to demonstrate compliance with a  
34 concentration-based treatment standard (refer to Section 4.5). Corroborative testing for the sample  
35 could be accomplished in the following manner.

- 36  
37 • Generators could use onsite laboratories or other laboratories to certify that the waste meets  
38 LDR requirements. For waste that does not meet LDR requirements, information must be  
39 supplied on the treatment methods necessary to meet LDR requirements and in accordance with  
40 WAC 173-303-380(1) (j), (k), (n), and (o).  
41  
42 • The T Plant operating organization uses these analytical data to ensure that the applicable  
43 requirements found in 40 CFR 268.7 and WAC 173-303-140(4) are met.  
44  
45 **(3) Waste knowledge exceptions.** This TSD unit is designed to provide information necessary to  
46 further disposition the waste (e.g., repackage, designate, segregate, sample, analyze, treat). The TSD  
47 unit ensures sufficient information is available or operational safeguards are in place to safely  
48 process waste.  
49

**2.1.3.2 Methodology to Ensure Compliance with LDR Requirements**

Generators are subject to LDR requirements and are required to submit all information, notifications, and certifications described in WAC 173-303-380(1) (j), (k), (n), and (o). Mixed waste not meeting the treatment standards, but meeting the TSD unit waste acceptance criteria, can be stored at the TSD unit. The following are general requirements for offsite notifications or onsite information and supporting documentation.

- The waste is subject to LDR, and the waste has been treated. The onsite generating unit/offsite generator supplies the appropriate LDR certification information (40 CFR 268).
- The waste is subject to LDR, and the onsite generating unit and/or offsite generator has determined that the waste meets LDR for disposal. The onsite generating unit/offsite generator develops the certification based on process knowledge and/or analytical data and supplies the appropriate LDR certification information necessary to demonstrate compliance with the LDR treatment standards of 40 CFR 268 and WAC 173-303-140. State-only LDRs do not require this type of certification.
- The waste is subject to LDR and requires further treatment to meet the applicable treatment standard.
  - Generator supplies additional information concerning the waste and details any treatment necessary to meet applicable treatment standards.
  - If waste is treated to meet state-only or federal LDRs at this TSD unit, this TSD unit prepares information necessary to meet WAC 173-303-380(1)(k) (refer to Section 7.4).

When demonstrating that a concentration-based LDR treatment standard has been met, a representative sample of the waste must be submitted for analysis. This sample could be taken by this TSD unit or the onsite generating unit/offsite generator and is required to comply with the LDR treatment standards contained in 40 CFR 268.40 and .48 for underlining hazardous constituents.

**2.1.4 Additional Requirements for Tank System Pre-Transfer/Shipment Review**

Additions to the 2706-T Building tank system are evaluated by the TSD unit using technical assessments, sampling, and characterization to ensure chemical compatibility and to ensure that the waste acceptance criteria for the tank system are satisfied.

**2.1.4.1 Tank Waste Assessment**

Assessments are performed during the work planning stage on liquid waste added directly and chemicals expected to be associated with the equipment/material for decontamination, as well as the decontamination agents expected to be added to the 2706-T Building tank system. These assessments address the following compatibility issues.

- Additions are compatible with the tank system.
- Additions do not create a chemical reaction with waste currently in the tank system.
- Additions do not exceed any of the maximum limits in the current waste stream profile sheet.
- Additions are consistent with the acceptance criteria of the receiving facility.

Additions that involve dangerous waste are, and will be, identified in the Hanford Facility RCRA Permit, T Plant, Chapter 1.0.

#### 2.1.4.2 Sampling and Characterization

Characterization of substances before addition to the 2706-T Building tank system is required to ensure that an accurate chemical compatibility assessment can be performed. The characterization is obtained through process knowledge provided by the generator of the waste/materials/equipment being received and/or analysis of samples.

For purposes of 2706-T Building tank waste characterization, samples of the waste are taken as necessary. The data obtained are used for evaluating operational systems and to prepare for transfer of waste. The frequency of sampling varies depending on the volumes and types of liquid entering the 2706-T Building tank system and established operational controls. The physical and chemical parameters for verification are chosen based on the waste profile sheet, tank contents, and the waste acceptance criteria of the receiving facility.

#### 2.1.4.3 Additional Acceptable Knowledge for 2706-T Building Tank System

In addition to the process described previously, pre-transfer/shipment review characterization information requirements for the 2706-T Building tank system must meet the acceptance criteria of the receiving facility. Because waste managed in the TSD unit could be transferred to LERF, ETF, DST System, or other receiving facility, waste introduced into the 2706-T Building tank system must not jeopardize the transfer of waste to the receiving TSD units. Acceptable knowledge must be obtained on waste accepted in the 2706-T Building tank system to facilitate the transfer of waste to a receiving facility.

## 2.2 VERIFICATION

Verification is an assessment performed by the TSD unit to substantiate that the waste received is the same as represented by the analysis supplied by the generator for the pre-transfer/shipment review. Verification is performed on waste received by this TSD unit. Verification includes container receipt inspection, physical screening, and chemical screening. Waste is not accepted by this TSD unit for treatment and/or storage until required elements of verification have been completed, including evaluation of any data obtained from verification activities. All conformance issues identified during the verification process are resolved in accordance with Section 2.4.3. Verification activities for liquid waste to be managed in the 2706-T Building are addressed in Section 2.1.4.

### 2.2.1 Container Receipt Inspection

Container receipt inspection is a mandatory element of the confirmation process. Therefore, 100 percent of each transfer/shipment is inspected at the TSD unit for possible damage or leaks, complete labeling, and intact tamper seals as required per Sections 2.2.2 and 2.2.3. This ensures that the transfer/shipment (1) is received at the TSD unit in good condition, (2) has the waste indicated on the transfer or shipping papers, (3) has not been opened after physical and/or chemical screening was performed, and (4) is complete. When a conformance issue exists, a case-by-case determination is performed, and the appropriate action is taken based on the severity of the issue. One of the following actions occurs:

- Implementation of the contingency plan in accordance with the Hanford Facility RCRA Permit, T Plant, Chapter 7.0

- Conformance issues resolved where additional information is needed to safely manage the waste before verification continues
- Continuation of verification for waste with conformance issues not meeting the criteria.

## **2.2.2 Physical Screening Process**

Physical screening is a verification element. This section describes the requirement pertaining to methods, frequency, and exceptions concerning the use of the physical screening process as a verification activity. Physical screening could be performed before the waste is transferred/shipped to this TSD unit. When screening is performed at a location not within the solid waste project TSD units, tamper-resistant seals are applied to each container examined and, on receipt at this TSD unit, verified as acceptable to ensure that no changes could have occurred to the waste content. Written procedures are maintained by the TSD unit detailing the requirements for adding and/or removing tamper-resistant seals. Documentation is maintained in the TSD unit operating record.

### **2.2.2.1 Physical Screening Methods**

The following physical screening methods, listed in order of preference, comply with the requirement to verify a waste:

1. Visual inspection (opening the container)
2. NDE.

Quality control (QC) pertaining to physical screening is discussed in Section 2.2.5.1. Section 3.1 provides the rationale for choosing a physical screening method.

### **2.2.2.2 Physical Screening Frequency**

The minimum physical screening frequency is 5 percent for onsite generating units, applied per waste stream per subcontractor per year. For offsite generators, the minimum physical screening frequency is 10 percent per waste stream per generator per year. The TSD unit adjusts the physical screening frequency for offsite generators based on objective performance criteria (refer to Section 2.3.1).

In the event that one of the containers in the original sample set fails, a second sample set of equal size, or a minimum of three additional containers, is selected from the transfer/shipment. First and second sample sets are selected using the rationale described in the pre-transfer/shipment review text (Section 2.1). A second failure in either the first or the second sample set constitutes failure of the transfer/shipment. If the second sample set passes inspection, the single failed container is considered an anomaly, and the remainder of the transfer/shipment passes verification. All failed containers and transfers/shipments are dispositioned via PES, as described in Section 2.3.

### **2.2.2.3 Physical Screening Exceptions**

The following are exceptions to the physical screening process outlined previously.

- Shielded, classified TRU retrieved waste and remote-handled mixed waste are not required to be screened physically; however, this TSD unit performs a more rigorous documentation review and obtains the raw data used to characterize the waste (less than 1 percent of current waste receipts). For classified waste, it is necessary to have an appropriate U.S. Department of Energy security clearance and a need to know the information as defined by the classifying organization or agency.

- Waste that physically cannot be screened at this TSD unit or an associated screening facility must be screened physically at the generator location (e.g., large components, containers that cannot be opened, are greater than 20 mrem per hour, contain greater than 10 nanocuries per gram of TRU radionuclides, or does not fit into a NDE unit). If no location can be found to perform the physical screening, no screening is required.
- Waste that is packaged by this TSD unit is considered to have met the physical screening requirements denoted in this WAP (e.g., T Plant operating organization packaged waste that is transferred to CWC, LLBG, and WRAP). On closure of the container, a tamper-resistant seal is applied to ensure content integrity.

### 2.2.3 Chemical Screening Process

Chemical screening is a verification element. This section describes methods, frequency, and exceptions for chemical screening. Chemical screening could be performed by this TSD unit before the waste is transferred. When screening is performed at a location not within the solid waste project TSD units (i.e., CWC, WRAP, LLBG), tamper-resistant seals are applied to each container examined and, on receipt at this TSD unit, verified as acceptable to ensure that no changes could have occurred to the waste content. Written procedures are maintained by this TSD unit detailing the requirements for adding and/or removing tamper-resistant seals. Documentation is maintained in the TSD unit operating record.

Selection and interpretation of the appropriate chemical screening method(s) are conducted and performed by qualified personnel. Unless otherwise noted, tests are qualitative, not quantitative. The objective of chemical screening is to obtain reasonable assurance that the waste received by the TSD unit generally is consistent with the description of the waste on the waste profile and to provide information that is used to safely manage the waste at the TSD unit. A minimum of three listed screening tests, including pH screening, are conducted on each sample. The following tests are selected depending on the waste matrix and the applicability of the method:

- pH
- Peroxide
- Oxidizer
- Water reactivity
- Halogenated organic carbons (chlor-n-oil/water/soil)
- Ignitability/headspace screening for volatile compounds
- Sulfide
- Cyanide
- Paint filter test.

Section 2.2.5.2 provides QC information pertaining to chemical screening.

#### 2.2.3.1 Chemical Screening Frequency

At a minimum, 10 percent of the mixed waste containers verified by physical screening (Section 2.2.2.2) must be screened chemically. The TSD unit obtains a representative sample, which could be a grab sample.

Small containers of waste (labpacks), not otherwise identified in the exceptions and packaged in accordance with 40 CFR 264.316, 40 CFR 265.316, and WAC 173-303-161, are screened chemically in

accordance with the chemical screening frequency of the waste stream as determined by PES (Section 2.4). Inner containers are segregated by physical appearance (e.g., color, physical state). At least one container from each group (or three containers if all are similar) are screened chemically.

#### **2.2.3.2 Chemical Screening Exceptions**

The following are cases in which chemical screening is not required:

- Small containers of waste in overpacked containers (labpacks) packaged in accordance with WAC 173-303-161 and not prohibited under LDR specified in WAC 173-303-140
- Waste exempted from the physical screening requirements (Section 2.2.2.3)
- Commercial chemical products in the original product container(s) (e.g., off-specification, outdated, or unused products)
- Chemical-containing equipment removed from service (e.g., ballasts, batteries)
- Waste containing asbestos
- Waste, environmental media, and/or debris from the cleanup of a spill or release of a single substance or commercial product or otherwise known material (e.g., material for which a MSDS can be provided)
- Confirmed noninfectious waste (e.g., xylene, acetone, ethyl alcohol, isopropyl alcohol) generated from laboratory tissue preparation, slide staining, or fixing processes
- Hazardous debris as defined in WAC 173-303-040.

Other special cases could be exempted on a case-by-case basis with prior approval from the Washington State Department of Ecology (Ecology).

#### **2.2.4 Sampling for Confirmation Screening**

Sampling is performed in accordance with WAC 173-303-110(2). A representative sample is obtained for chemical screening. The chemical screening methods described in Section 3.0 do not require any sample preservation methods because the screening tests are performed at the time and location of sampling or as soon as possible thereafter. When a delay is required, the samples are stored in a manner that maintains chain of custody and protects the sample composition. The equipment requirements in Section 4.0, Table 4-1, apply to sampling for chemical screening.

#### **2.2.5 Quality Assurance and Quality Control for Confirmation Process**

The following quality assurance (QA) and QC elements are used by this TSD unit to ensure confirmation activities provide sufficient data to provide an indication that waste received is as described in the transfer/shipping documentation.

Screening methods have sufficient performance levels to yield valid decisions when considering method variability (precision and accuracy).

#### 2.2.5.1 Physical Screening Quality Control

This section describes the QC used by this TSD unit to ensure that quality data are obtained when performing physical screening methods identified in Section 2.2.2, except visual inspection. Physical screening QC is used only to ensure that quality data are obtained when performing NDE. Visual inspection does not consist of the use of instrumentation or chemical tests. QC objectives for visual inspection are obtained through the appropriate training.

The following QC elements apply to NDE used for physical screening.

- A penetration test is performed when image data generating components are changed to document system capability has not changed.
- A resolution test is performed at the beginning of a shift. A shift ends when shutdown activities are performed. A shift can be up to 24 hours.
- A radiographer is qualified per SNI-TC-1A, *Personnel Qualification and Certification in Nondestructive Testing*, Level II certification of American Society for Nondestructive Testing training.
- Examination must cover 100 percent of the waste in the container.
- Five percent per year of the containers that have been nondestructively examined are opened to ensure the method is providing accurate data. Containers opened for other reasons, such as chemical screening or to investigate inconsistencies, could be used to meet this requirement. This requirement is based on the total number of containers reviewed, not on a transfer/shipment or general waste stream basis. The TSD unit is required, at a minimum, to meet this requirement over a running 3-month average, with a minimum of one container being opened for every month NDE is operated.
- At least annually, a capability demonstration is performed on a training drum.

#### 2.2.5.2 Chemical Screening Quality Control

The following QC elements are used when performing chemical screening.

- Appropriate sample containers and equipment are used. Containers and equipment of the appropriate size that are chemically compatible with the waste and testing reagents are used.
- Reagent checks are used.
  - Water that is reagent grade and from a documented source is used.
  - Chemicals and test kits are labeled so that these are traceable and documented in the TSD unit operating record.
  - QC checks are performed on each test kit and associated reagents and documented in the TSD unit operating record unless a more frequent period is specified in the test kit instructions.

## **2.3 WASTE TRANSFERS AMONG SOLID WASTE PROJECT TSD UNITS**

Transfers from the CWC, WRAP, or LLBG TSD units to this TSD unit might be necessary to perform verification, to obtain additional knowledge to support treatment/disposal, to make the waste amenable for long-term storage, or to perform treatment. A technical review is required to ensure compliance with the T Plant Part A, Form 3, and waste acceptance criteria. For waste that is being transferred from CWC, WRAP, or LLBG to this TSD unit, the following requirements apply.

### **2.3.1 Waste Stream Approval Process**

The waste stream already must have been approved using the process described in Section 2.1.1. Waste knowledge exceptions could apply as described in Section 2.1.3.1.

For retrieval of suspect TRU waste streams from the LLBG, precautions are necessary to ensure that sufficient information is available to further disposition the waste. TRU waste containers are transferred out of the LLBG to CWC or another TSD unit and ultimately received at this TSD unit for packaging and/or treatment. The amount and type of data that exist for a given waste package vary widely and depend on the documentation requirements in effect when the waste was generated. The onsite generating unit is required to supply specific information concerning the waste package contents on a solid waste storage/disposal form. A technical review of the records is performed, as described in Section 2.3.2, and suspect dangerous waste items are identified. Suspect mixed waste is managed assuming a worst-case basis until a waste designation can be completed. Additionally, a visual inspection to confirm integrity is performed on the containers before transfer.

### **2.3.2 Waste Transfer Approval Process**

A technical review of documentation associated with each waste container in the transfer is performed to ensure the waste meets the TSD unit waste acceptance criteria. The individual container data, inclusive of all knowledge obtained on the container, are compared to T Plant waste acceptance requirements. If necessary, the waste management path (waste specification record) previously assigned to the waste stream is updated, and relabeling/remarking is completed before the transfer. Waste is tracked through processing at this TSD unit in accordance with Section 1.3. As new information is obtained on the waste, the container is managed to any new requirements. Updates to container data during transfer and subsequent processing activities are reflected in SWTS, documented, and maintained in accordance with Section 8.0.

### **2.3.3 Verification**

For container receipt inspection, 100 percent of each transfer is inspected for damage and to ensure the waste containers are those indicated on the documentation. This activity is a mechanism for identifying any document conformance issues or damaged containers before receipt/acceptance. Conformance issues identified during receipt are managed as described in Section 2.2.1.

For physical and chemical screening, waste that has not been accepted at WRAP, CWC, T Plant, or LLBG, physical and/or chemical screening is completed as described in Sections 2.2.2 and 2.2.3.

#### 2.3.4 Performance Evaluation System

The performance of the onsite generating unit is evaluated and documented in accordance with the PES as described in Section 2.4. The PES is used to determine physical screening frequency and to determine corrective actions for conformance issues. The performance evaluation considers all newly generated waste accepted at CWC, WRAP, LLBG, and T Plant TSD units.

### 2.4 DESCRIPTION OF PERFORMANCE EVALUATION SYSTEM

The PES is used to determine the initial physical screening frequency of each waste stream. The PES provides a periodic status of performance of the generator for waste received. Also, the PES provides a mechanism for addressing corrective actions, resolving waste acceptance issues, and adjusting physical screening frequency.

#### 2.4.1 Initial Physical Screening Frequency Determination

The initial physical screening frequency is determined based on the following process.

- The TSD unit reviews the waste profile information to determine the relative potential for misdesignation or inappropriate segregation based on all relevant information including any previous experience with the generator. Based on this review, the TSD unit identifies any concerns associated with the following criteria:
  - Documented waste management program
  - Waste stream characterization information
  - Potential for inappropriate segregation.
- Based on the identification of concerns during the review, the TSD unit establishes the initial physical screening frequency for the new waste stream based on the following criteria.
  - Initial physical screening frequency of, at a minimum, 20 percent: No concerns identified; e.g., cleanup of contaminated soil where the soil has been well characterized and no other waste generation processes are occurring at that location.
  - Initial physical screening frequency of, at a minimum, 50 percent: Concern(s) identified in one criterion (e.g., a facility that generates debris from many different processes and with the potential for many different management paths).
  - Initial physical screening frequency of 100 percent: Concerns identified in two or more criteria (e.g., a facility with many different processes and minimal segregation controls).

#### 2.4.2 Performance Evaluation

A performance evaluation is used to trend the waste acceptance performance of the generator and is used to adjust the overall physical screening frequency. This evaluation, identified as an integral part of the QA program, is objective and considers the conformance issues documented during the pre-transfer/pre-shipment review and verification functions. The TSD unit maintains written procedures to (1) perform

evaluations based on conformance issues identified, (2) evaluate unsatisfactory performance for corrective actions, and (3) adjust physical screening rates accordingly.

The performance evaluation is conducted and subsequently accepted by the PES team and is documented and maintained in accordance with Section 8.0. Performance evaluation frequency is based on frequency of transfer/shipments and generator performance.

#### **2.4.3 Conformance Issue Resolution**

Conformance issues could result in a waste container that does not meet waste acceptance criteria of this TSD unit. A conformance issue is any discrepancy identified during the confirmation process with waste package documentation, a waste package, or a transfer/shipment. Conformance issues can be identified during pre-transfer/shipment reviews of waste streams or during the verification process. If a possible conformance issue is identified, the following actions are taken to resolve the issue.

- The TSD unit compiles all information concerning the possible conformance issue(s).
- The generator is notified and requested to supply additional knowledge that could assist in the resolution of the concern(s). If information is supplied that resolves the concern(s) identified, no further action is required.
- On determination that a conformance issue has been identified during verification, the TSD unit personnel and the generator discuss the conformance issue and identify the appropriate course of action to resolve the container/transfer/shipment in question; i.e., pick another sample set, return the container/transfer/shipment, divert the container/transfer/shipment to another TSD unit that can accept the container/transfer/shipment and resolve the issue, or the generator resolves the issue at the TSD unit. If the conformance issue(s) results in the failure of a transfer/shipment, the physical screening frequency for the stream is adjusted to 100 percent. Other streams from the same onsite generator with the potential to exhibit the same failure also are adjusted to 100 percent until the issue(s) can be addressed adequately.
- For transfer/shipment failures, the TSD unit requests the generator to provide a corrective action plan (CAP) that clearly states the reason for the failure and describes the actions to be completed to prevent recurrence. The generator could request a reduction in verification of unaffected streams. This request must be accompanied by a justification that identifies why this stream(s) would not exhibit the same conformance issue.
- The TSD unit reviews the CAP and stream justification for adequacy. If the CAP is inadequate, the generator remains at a physical screening rate of 100 percent. If the stream justification is adequate, the TSD unit could provide an alternative frequency as denoted in Section 2.4.2.

#### **2.4.4 Process for Reducing the Physical Screening Frequency**

Screening rate frequencies and changes to those frequencies could be applied to a specific waste stream or to a specific onsite generating unit/offsite generator based on the circumstances surrounding the conformance issue. After the initial screening frequency for a given waste stream has been established or increased, the physical screening frequency can be reduced in accordance with the following process.

The physical screening frequency is reduced in three steps. Reduction for all steps is based on the ability to demonstrate that five containers from the waste stream in question pass verification. In addition,

1 reduction to the minimum frequency requires that the TSD unit documents an acceptable evaluation of the  
2 CAP. At no time will the physical screening frequency be reduced below 5 percent for waste generated  
3 onsite or below 10 percent for offsite generators.  
4

- 5 • Step 1. Reduce frequency by up to 66 percent after five containers from the waste stream in question  
6 pass verification.  
7
- 8 • Step 2. Reduce frequency established in Step 1 by up to 50 percent or to the minimum allowable,  
9 whichever results in a greater frequency, after five containers from the waste stream in question pass  
10 verification.  
11
- 12 • Step 3. Reduce frequency established in Step 2 to the minimum allowable after five containers from  
13 the waste stream in question pass verification. The TSD unit documents an acceptable evaluation of  
14 the CAP.  
15

16 The screening rate reduction is established during periodic PES team evaluations and the documentation  
17 is maintained according to Section 8.0 of this WAP. The percentage of the reduction is based on the  
18 evaluation of the relative severity of the original conformance issue, the status of the CAP, any interim  
19 actions taken by the onsite generating unit/offsite generator, the performance of the onsite generating  
20 unit/offsite generator for this waste stream before this reduction, and/or other factors deemed relevant.  
21  
22

## 23 **2.5 WASTE ACCEPTANCE**

24 Initial acceptance of waste occurs only after the confirmation process is complete. Conformance issues  
25 identified during the confirmation process are documented and managed in accordance with Section 2.4.  
26 Conformance issues that must be corrected before waste acceptance include the following:  
27

- 28 • Waste not matching approved profile documentation
- 29 • Designation, physical, and/or chemical characterization discrepancy
- 30 • Incorrect LDR paperwork
- 31 • Packaging discrepancy
- 32 • Manifest discrepancies as described in WAC 173-303-370(4)(a).  
33

34 For waste transfers/shipments with unresolved conformance issue(s) that exceed 90 days, this TSD unit  
35 contacts Ecology at least once per calendar quarter.

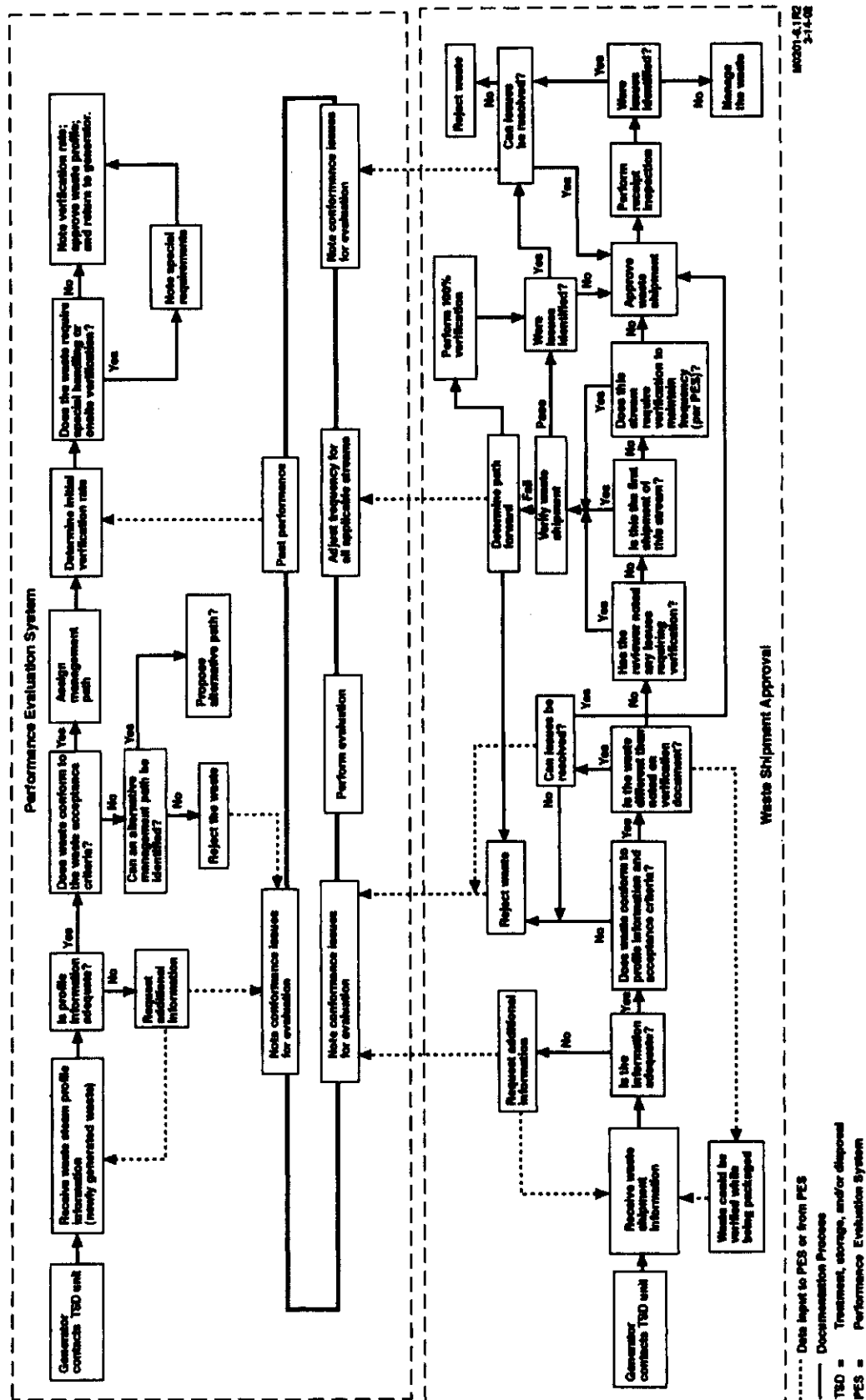


Figure 2-1. Confirmation and Waste Acceptance Process.

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### 3.0 SELECTING WASTE ANALYSIS PARAMETERS

Physical and chemical screening parameters for verification must be chosen from those in Sections 3.1 and 3.2. Other sampling and analysis parameters are addressed in Section 3.3. Waste analysis screening parameters are selected to demonstrate that the waste matches the transfer/shipping documentation. Parameters, methods, and rationale for physical and chemical screening parameters are provided in Table 3-1.

#### 3.1 PHYSICAL SCREENING PARAMETERS

The following methods are approved for use in performing physical screening.

(1) Visual inspection (preferred method for physical screening)

**Rationale:** This method meets the requirement to ensure consistency among waste containers and the accompanying transfer/shipment documentation.

**Method:** The container is opened and the contents are removed, as needed, for visual examination. Homogenous loose solids are probed to determine the presence of material not documented on the transfer/shipment documentation or for improperly absorbed liquids. Visual observations are compared to the applicable profile information and the container-specific information on the transfer/shipment documentation.

**Failure Criteria:** A container fails inspection for any of the following reasons: (a) undocumented or improperly packaged waste; (b) discovery of prohibited articles or materials listed in Section 1.2; (c) discovery of material not consistent with the applicable waste stream profile; and (d) variability greater than 25 percent by volume in listed constituents (e.g., paper, plastic, cloth, metal).

(2) NDE

**Rationale:** This method meets the requirement to ensure consistency among waste containers and the accompanying transfer/shipment documentation. This method is subject to the QC requirements in Section 2.2.5.1. Containers that easily are not amenable to visual inspection because of physical or radiological content or facility availability can be examined safely and economically.

**Method:** The container is scanned with a NDE system. Data are observed on a video monitor and captured on video tape. Personnel experienced with the interpretation of NDE imagery record their observations. These observations are compared to the contents listed on the accompanying transfer/shipment documentation.

**Failure Criteria:** A container does not meet inspection criteria for any of the following reasons: (a) undocumented or improperly packaged waste; (b) discovery of prohibited articles as listed in Section 1.2; (c) image data not consistent with the applicable waste stream profile; and (d) variability greater than 25 percent by volume in listed constituents (e.g., paper, plastic, cloth, metal).

## 3.2 CHEMICAL SCREENING PARAMETERS

The following methods are approved for use in performing chemical screening test. Chemical screening is used to verify that incoming waste is consistent with documentation. Failure of a chemical screening test is defined as a chemical screening result that is inconsistent with the associated documentation.

### (1) Ignitability and/or headspace volatile organic compound screening

**Rationale:** To determine the potential ignitability and the presence or absence of volatile organic compounds in waste and to ensure personnel are protected adequately. This method is used when containers are opened for inspection. This method can be applied to any matrix.

**Method:** A sample of the headspace gases in a container is analyzed by one or more of the following types of portable instrumentation: organic vapor monitor, colorimetric gas sampling tubes, or a lower explosive level meter.

**Failure criteria:** High organic vapor readings in matrices not documented as having volatile organic content constitute failure.

### (2) Peroxide screening

**Rationale:** To determine the presence of organic peroxides in solvent waste, to alert personnel to potential hazards, to ensure safe segregation and storage of incompatible waste, and to confirm consistency with the transfer/shipment documentation. The test is sensitive to low parts-per-million ranges.

**Method:** A peroxide test strip is dampened with a pipette sample of liquid waste. Solids are tested by first wetting the test strip with water and contacting a small sample of the waste. A blue color change indicates a positive reaction. The color change can be compared with a chart on the packaging to determine an approximate organic peroxide concentration.

**Failure criteria:** Peroxide concentrations greater than 20 parts per million in liquid waste constituents that are known organic peroxide formers not documented as having been stabilized constitute failure.

### (3) Paint Filter Test

**Rationale:** To verify the presence or absence of free liquid in solid or semisolid material.

**Method:** To a standard paint filter, 100 cubic centimeters or 100 grams of waste are added and allowed to settle for 5 minutes. Any liquid passing through the filter signifies failure of the test. The required method for the paint filter test is Method 9095 in the U.S. Environmental Protection Agency (EPA) SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (the most recently promulgated version).

**Failure criteria:** Failure of the test in waste matrices not documented as having free liquids constitutes failure of the container. Small quantities of condensate trapped in inner plastic liner folds are acceptable.

1 (4) pH screen

2  
3 **Rationale:** To identify the pH and corrosive nature of an aqueous or solid waste, to ensure safe  
4 segregation and storage of incompatible waste, and to confirm consistency with the  
5 transfer/shipment documentation.

6  
7 **Method:** pH measurement is performed in accordance with written methods maintained by the  
8 TSD unit or by manufacturer's suggested methodology that conforms with the requirements of  
9 Section 2.2.5.

10  
11 **Failure criteria:** If the pH of a matrix exceeds regulatory limits (less than or equal to 2.0 or  
12 greater than or equal to 12.5) in waste not documented as being regulated for this property, the  
13 container fails verification.

14  
15 (5) Oxidizer screen

16  
17 **Rationale:** To determine if a waste exhibits oxidizing properties, to ensure safe segregation and  
18 storage of incompatible waste, and to confirm consistency with the transfer/shipment  
19 documentation. This test can be applied to waste liquids, solids, and semisolids.

20  
21 **Method:** Acidified potassium iodide (KI) test paper is used to measure the oxidizing properties of  
22 solid or liquid waste in accordance with written methods maintained by this TSD unit or by  
23 manufacturer's suggested methodology that conforms with the requirements of Section 2.2.5.

24  
25 **Failure criteria:** A positive indication in a waste that is not consistent with documented  
26 constituents fails verification.

27  
28 (6) Water reactivity screen

29  
30 **Rationale:** To determine if the waste has the potential to vigorously react with water or to form  
31 gases or other reaction products. This information is used to ensure safe segregation and storage of  
32 incompatible waste and to confirm consistency with the transfer/shipment documentation.

33  
34 **Method:** Water reactivity screen is performed in accordance with written methods maintained by  
35 this TSD unit or by manufacturer's suggested methodology that conforms with the requirements of  
36 Section 2.2.5.

37  
38 **Failure criteria:** A positive indication in a waste that is not consistent with documented  
39 constituents fails verification.

40  
41 (7) Cyanide screen

42  
43 **Rationale:** To indicate if waste could release hydrogen cyanide on acidification near pH 2. This  
44 information is used to ensure safe segregation and storage of incompatible waste and to confirm  
45 consistency with the transfer/shipment documentation.

46  
47 **Method:** A cyanide screen is performed in accordance with written methods maintained by this  
48 TSD unit or by manufacturer's suggested methodology that conform with the requirements of  
49 Section 2.2.5.

50  
51 **Failure criteria:** A positive indication in a waste that is not consistent with documented  
52 constituents fails verification.

(8) Sulfide screen

**Rationale:** To indicate if the waste could release hydrogen sulfide on acidification near pH 2. This information is used to ensure safe segregation and storage of incompatible waste and to confirm consistency with the transfer/shipment documentation.

**Method:** A sulfide screen is performed in accordance with written methods maintained by this TSD unit or by manufacturer's suggested methodology that conform with the requirements of Section 2.2.5.

**Failure criteria:** A positive indication in a waste that is not consistent with documented constituents fails verification.

(9) Halogenated organic carbon screen

**Rationale:** To indicate whether PCBs or other chlorinated solvents are present in the waste. This information is used to confirm consistency with the transfer/shipment documentation and to determine if additional information/data are needed to properly store and treat the waste.

**Methods:** Field organic chlorine tests appropriate to the matrix, such as those offered by the Dexsil Corporation (e.g., chlor-n-oil, chlor-n-soil), are used. These screening tests are available with several detection limits that enable verification to be performed in the concentration range applicable to the proposed management path of the waste.

**Failure criteria:** A positive indication of chlorinated organics in a waste that is not documented as having chlorinated organic content constitutes failure.

### 3.3 OTHER ANALYSIS PARAMETERS

Parameters needed to meet designation, characterization, and LDR requirements for waste stored and/or treated at this TSD unit are identified in Table 3-2.

In determining the characteristic of ignitability (flashpoint), either the Pensky-Martens (Method 1010) or the Setaflash (Method 1020) must be employed when testing. The characteristic of corrosivity also requires a specific test method. When testing the pH of a given waste stream, Method 9040 or Method 9045 must be used in accordance with WAC 173-303-090(6).

Compliance with LDR for waste that has a treatment standard expressed as constituent concentrations in waste (40 CFR 268.40) can be shown using any appropriate method. If the waste treatment standard is expressed as constituent concentrations in waste extracts (40 CFR 268.40), the toxicity characteristic leaching procedure (TCLP), which is referenced specifically in 40 CFR 268.41(a), must be performed. Following that, however, any appropriate method could be used to determine concentrations of hazardous constituents in the extract and to show compliance with LDR. Both cyanides (total) and cyanides (amenable) for nonwastewaters are to be analyzed using Method 9010 or 9012, as incorporated by reference in 40 CFR 260.11.

For other parameters or methods not otherwise specified, the following are acceptable sources of testing methods (standard methods):

- 1 • Analytical methods cited in WAC 173-303
- 2
- 3 • The most recently promulgated version of SW-846
- 4
- 5 • Other current EPA methods, as applicable to the matrix under evaluation
- 6
- 7 • *Standard Methods for the Examination of Water and Wastewater*, American Public Health
- 8 Association (APHA), American Water Works Association, Water Environment Federation
- 9
- 10 • *Annual Book of ASTM Standards*, American Society for Testing and Materials
- 11
- 12 • *AOAC Official Methods of Analysis*, AOAC (Association of Official Analytical Chemists),
- 13 International.
- 14
- 15 Appropriate QA/QC documentation is required to be maintained per Section 5.0, regardless of the method
- 16 used.
- 17
- 18

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Table 3-1. Parameters and Rationale for Physical and Chemical Screening.

Parameter	Method*	Rationale for selection
<b>Physical screening</b>		
Visual inspection	Field method - observe phases, presence of solids in waste	Confirm consistency between waste and transfer/shipping documentation.
Nondestructive examination	Field method	Confirm consistency between waste and transfer/shipping documentation.
<b>Chemical screening</b>		
Ignitability and/or headspace volatile organic compound screening	Organic vapor monitor, colorimetric gas sampling tubes, or a lower explosive level meter	Confirm consistency between waste and transfer/shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Peroxide	Field peroxide test paper	Confirm consistency between waste and transfer/shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Liquids	SW-846, Method 9095, Paint Filter Test	Confirm consistency between waste and transfer/shipping documentation.
pH	Field pH screen (pH paper method)	Confirm consistency between waste and transfer/shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Oxidizer	Field potassium iodide test paper	Confirm consistency between waste and transfer/shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Water reactivity	Field water mix screen	Confirm consistency between waste and transfer/shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Cyanides	Field cyanide screen	Confirm consistency between waste and transfer/shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Sulfides	Field sulfide screen	Confirm consistency between waste and transfer/shipping documentation; ensure compliance with WAC 173-303-395(1)(b).
Halogenated organic carbons	Screening test method for PCBs in transformer oil(SW-846, Method 9079 Oil)	Determine if polychlorinated biphenyls or other chlorinated solvents are present in the waste to confirm consistency between waste and transfer/shipping documentation.

\*Procedures based on manufacturer's recommended methodology unless otherwise noted. When regulations require a specific method, the method is followed.

SW-846, *Test Methods for Evaluating Solid Waste*, latest edition, U.S. Environmental Protection Agency, Washington, D.C.

WAC 173-303, "Dangerous Waste Regulations".

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Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at T Plant. (4 sheets total)

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
General chemistry				
Flashpoint	1010/1020	Liquid	To provide documentation for safe storage conditions.	To determine regulatory status as D001 waste and to provide proper waste designation and applicability of LDR requirements.
pH	9040 9045c	Liquid, sludge	To indicate the degree of corrosivity for safe handling, to provide for proper waste designation, and to identify waste that might compromise container integrity.	To determine regulatory status as D002 waste, to provide proper waste designation, and applicability of LDR requirements and state-only requirements.
		Solid		
Hydroxide	9040	Liquid	To provide documentation for safe treatment and storage conditions and to comply with DST System waste acceptance criteria.	To provide proper waste designation and applicability of LDR requirements.
Water reactivity	Field method	Liquid, sludge	To determine whether the waste has a potential to violently react with water to form gases or generate heat, to provide documentation for safe treatment and/or storage conditions for waste designation, and to comply with TSD unit waste acceptance criteria.	To provide proper waste designation for safe storage and management.
Free liquids	9095A	Liquid, sludge, solid	To determine applicability of LDRs and for characterization of appropriate treatment.	To determine appropriate state-only LDR status of waste.
Cyanide	9010B/9012A	Liquid, sludge, solid	For safe storage, for proper waste designation, applicability of LDR, and characterization of appropriate treatment.	To provide proper waste designation and applicability of LDR requirements.
Sulfide	9030B	Liquid, sludge, solid	For safe storage, for proper waste designation, applicability of LDR, and characterization of appropriate treatment.	To provide proper waste designation and applicability of LDR requirements.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at T Plant. (4 sheets total)

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Organic analyses				
Polychlorinated biphenyls	8081A/8082	Liquid, sludge, solid	To determine proper waste designation for management of waste in accordance with TSCA and WAC 173-303.	To provide proper waste designation and to meet TSCA and LDR requirements.
Total organic carbons	9060	Liquid, sludge, solid	To determine applicability of LDR and applicability to state-only requirements.	To provide proper waste designation and applicability to state-only requirements, to meet LDR requirements, and to meet DST System waste acceptance criteria.
Total organic halides	9020B/9021/9022	Liquid, sludge	To determine proper waste designation and applicability to state-only requirements.	To provide proper waste designation and applicability to state-only requirements.
Persistent constituents	9075/9076/9077/ 9211/9212/9214/ 9250/9251/9253			
Total suspended solids	160.2 <sup>b</sup>	Liquid, sludge	To determine applicability of LDR and status as a wastewater.	To provide applicability of LDR and status as a wastewater.
Volatile organic compounds	1311/8260B	Liquid, sludge, solid	To determine proper waste designation, applicability of LDRs, and characterization of appropriate treatment.	To provide proper waste designation, regulatory status, and applicability of LDR requirements.
Semi-volatile organic compounds	1311/8270A	Liquid, sludge, solid	To determine proper waste designation, applicability of LDRs, and characterization of appropriate treatment.	To provide proper waste designation, regulatory status, and applicability of LDR requirements.
Chlorinated herbicides	8151A	Liquid	Not applicable	To provide proper waste designation and applicability to state-only requirements.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at T Plant. (4 sheets total)

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Inorganic analyses				
Arsenic	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Barium	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Cadmium	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Chromium	1311/6010B	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Lead	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Mercury	1311/7470	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Silver	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.

Table 3-2. Analytical Parameters, Methods, and Rationale for Waste Received at T Plant. (4 sheets total)

Parameter	Analytical method <sup>a</sup>	Media type	Rationale for selection of waste acceptance parameters	Rationale for analysis
Selenium	1311/6010	Liquid, sludge, solid	To provide for proper waste designation, applicability of LDRs, and for characterization of appropriate treatment.	To determine proper waste designation, regulatory status as a toxic characteristic waste, and applicability of LDR requirements.
Nickel	6010	Liquid, sludge, solid	To determine applicability of LDRs and for characterization of appropriate treatment.	To meet LDR requirements.

<sup>a</sup> SW-846 unless otherwise noted.

<sup>b</sup> EPA-600/4-7-020 unless otherwise noted.

DST = Double-Shell Tank (System).

LDR = land disposal restrictions.

EPA-600/4-79-020, *Methods for Chemical Analysis of Water and Wastes*, U.S. Environmental Protection Agency, Cincinnati, Ohio.

SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Method*, latest edition, Office of Solid Waste, U.S. Environmental Protection Agency, Washington, D.C.

WAC 173-303, "Dangerous Waste Regulations".

## 4.0 SELECTING SAMPLING METHODS

Specific sampling methods and techniques depend on both the nature of the material and the type of packaging. Waste samples are treated and preserved, as necessary, to protect the sample. Recommended treatment, preservation techniques, and holding times are used as stated in SW-846. This section describes the sampling methodology used to obtain representative samples.

### 4.1 SAMPLING STRATEGIES

Table 4-1 shows waste forms and sample equipment used to sample referenced waste. Sampling of these waste forms is performed in accordance with Table 4-1.

### 4.2 SAMPLING METHODS

The appropriate personnel are responsible for arranging all sampling and laboratory support for sample analysis. Samples are processed at one of several qualified laboratories (refer to Section 5.0). Sampling methods are those described in WAC 173-303 110(2).

Sampling typically includes the following:

- Obtain a unique sample number and complete the sample tag before sampling
- Obtain a precleaned sampler and sample bottles
- Attach sample label to sample bottles
- For sampling liquid waste, use a sampler or pipette to sample for two-phase liquids; pour homogeneous liquids in small containers into a sample bottle
- For sampling solid waste, use a scoop, trier, or hand auger to obtain a sample of the waste. For large containers of waste, composite several augers or scoops to ensure samples are representative
- Fill sample containers in the following sequence: volatile organics, semi-volatile organics, metals, ignitability, pH (corrosivity)
- For solid waste, wipe the exterior surfaces of the sample bottles with a dry rag
- Place samples in an appropriate receptacle for transfer to the laboratory
- Complete chain-of-custody forms
- Seal and mark the receptacle in accordance with WAC 173-303-071(3)(1)
- Transfer receptacle to the analytical laboratory, as appropriate, to meet sample holding times
- Properly clean and decontaminate nondisposable sampling equipment or package for return to central sampling equipment decontamination area according to onsite requirements.

### 4.3 SELECTING SAMPLING EQUIPMENT

Sampling equipment selection is detailed in Table 4-1. Sampling equipment needed to sample waste is maintained and decontaminated as necessary.

### 4.4 SAMPLE PRESERVATION

Waste samples are treated and preserved, as necessary, to protect the sample. Sample preservation follows SW-846 protocol except as amended by the Hanford Facility RCRA Permit, T Plant.

### 4.5 ESTABLISHING QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES FOR SAMPLING

The TSD unit sampling procedures ensure that all samples are labeled with a unique identifier.

Sample collectors prepare a permanent log of sampling activities. The log of sampling activities is maintained in accordance with SW-846, Chapter 9.0. Log entries include, as appropriate: date of collection, time of collection, location, batch number, sample number, tank number, copy of the chain-of-custody form, sampling methodology, container description, waste matrix (liquid), description of generating process (e.g., decontamination activities), number and volume of samples, field observations, field measurements (e.g., pH, percent lower explosive limit), laboratory destination and laboratory number, and signature. These log entries are made while sampling is performed. The logs or copies of logs are maintained by appropriate personnel after completion of sampling activities.

A chain-of-custody record accompanies samples at all times. The TSD unit maintains written chain-of-custody methods to ensure accountability of waste sample handling and to ensure sample integrity.

During all sampling activities, strict compliance with applicable industrial hygiene and safety standards is mandatory. If samplers accidentally contact waste material and sampling personnel, decontamination of sampling personnel is performed immediately. Transportation of samples is performed in accordance with all applicable Hanford Site and U.S. Department of Transportation requirements.

The following QA/QC elements are used to ensure sampling activities for designation purposes result in acceptable laboratory data:

- Representative sampling methods as defined by WAC 173-303-110(2); 40 CFR 261, Appendix I; and/or SW-846, Chapter 9.0
- Appropriate sample containers and equipment
- Samples numbered
- Traceable labeling system
- Field QA/QC samples (applicable sampling and analysis plan)

- 1 • Equipment calibration (current as applicable)
- 2
- 3 • Chain of custody.
- 4

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Table 4-1. T Plant Chemical Screening Sampling Equipment.

Waste form	Reference in SW-846, Chapter 9.0	
	Waste	Equipment*
Liquids	Free-flowing liquids and slurries	COLIWASA, glass thief or pipette
Solidified liquids	Sludges	Trier, scoops, and shovels
Sludges	Sludges	Trier, scoops, and shovels
Soils	Sand or packed powders and granules	Auger, scoops, and shovels
Absorbents	Large-grained solids	Large trier, scoops, and shovels
Wet absorbents	Moist powders or granules	Trier, scoops, and shovels
Process solids and salts	Moist powders or granules	Trier, scoops, and shovels
	Dry powders or granules	Thief, scoops, and shovels
	Sand or packed powders and granules	Auger, scoops, and shovels
	Large-grained solids	Large trier, scoops, and shovels
Ion exchange resins	Moist powders or granules	Trier, scoops, and shovels
	Dry powders or granules	Thief, scoops, and shovels
	Sand or packed powders and granules	Auger, scoops, and shovels

COLIWASA = composite liquid waste sampler.

\*Other ASTM-approved equipment could be used to collect samples. The equipment requirements of Table 4-1, as amended by any Hanford Facility RCRA Permit conditions, apply to sampling for chemical screening. In addition, the following sampling equipment could be used in sampling for chemical screening: (1) for liquids and slurries: dip, tank, bomb, and bailer samplers as well as tube-type samplers (e.g., thin-walled Shelby tubes, split spoons, probes) and (2) for sludges and solids: tube-type samplers (as stated) and augers; for small containers, a spoon could be used in place of a scoop.

SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*, U.S. Environmental Protection Agency, Washington, D.C.

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## **5.0 SELECTING A LABORATORY AND QUALITY ASSURANCE/QUALITY CONTROL**

The QA and QC requirements outlined in this section are applicable to laboratory activities governed by this WAP. The selection of any laboratory is based on the ability of the laboratory to demonstrate compliance to this section with experience and capability in the following major categories:

- Comprehensive written QA/QC program
- Technical analytical expertise
- Effective information management systems.

### **5.1 EVALUATION OF LABORATORIES**

All laboratories providing analytical support to the TSD unit are required to have a laboratory QA plan. The laboratory QA plan is submitted to the TSD unit for review before the commencement of analytical work. The QA plan, at a minimum, addresses the following elements:

- Sample custody and management practices (also refer to Section 4.0)
- Sample preservation protocols
- Sample preparation and analytical procedure requirements
- Instrument maintenance and calibration requirements
- Internal QC measures, e.g. method blanks, spikes.

Each laboratory is audited periodically to evaluate the effective implementation of the QA/QC program. QA personnel and a technical expert evaluate the laboratory through onsite observations and/or reviews of the following documentation: copies of the QA/QC documents, records of surveillances/inspections, audits, nonconformances, and corrective actions.

### **5.2 QUALITY ASSURANCE/QUALITY CONTROL OBJECTIVES**

The overriding goal of the analytical program is to support the accurate designation of waste and/or to demonstrate compliance to LDR standards. Laboratory QA/QC programs are designed to meet the following objectives.

- Minimize errors. Errors could be introduced during preparative, analytical, and/or reporting phases of work. QC programs enable the source(s) of error to be identified and enable appropriate precautions to be taken to minimize the errors.
- Provide information. The designation of waste relies on a combination of knowledge and data. The use of analytical laboratories with QA/QC programs ensures accurate, reliable analytical data are available to support proper waste management.

QC program elements include analysis of samples to written and approved procedures and certification of the laboratory. Key QA program elements are designed to provide objective evidence that waste testing meets the performance specifications of the TSD unit. QA activities and implementation responsibilities are as follows.

- Activity based laboratory inspections. Inspections are performed by the TSD unit. Inspections verify that specific guidelines, specifications, or procedures for the activities are completed successfully.
- Laboratory analysis. Analyses are performed by onsite or offsite laboratories on samples of waste using written and approved procedures.
- Development of inspection checklists. Checklists are required for laboratory inspections and are designed to ensure that the inspected activity consistently is addressed. Checklists are completed during the inspection to document results.
- Instrument calibration and calibration verification. These activities are performed by the laboratory, and are required for ensuring data of known accuracy and precision. Calibration data are maintained and stored to ensure tractability to reported results.

### 5.3 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

All analytical work is defined and controlled by a statement of work, work order, or other work authorizing documentation. Samples are handled according to approved laboratory procedures. The accuracy, precision, and limitations of analytical data are determined by QC performance.

As needed, the TSD unit conducts analyses to determine completeness of information and whether waste meets the waste acceptance criteria for TSD at one of the Hanford Facility TSD units or those of a chosen offsite TSD facility. Testing and analytical methods depend on the type of analysis sought and the reason for needing the information. For parameters or methods, refer to Section 3.0.

### 5.4 DATA ASSESSMENT

The acquired data need to be scientifically sound, of known quality, and thoroughly documented. Data validation is not required; however, the TSD unit is responsible to ensure that data assessment or evaluation is completed. Data are assessed to determine compliance with quality standards approved by Ecology and this WAP, which are as follows.

**Precision** – The overall precision is the agreement between the collected samples (duplicates) for the same parameters, at the same location, subjected to the same preparative and analytical techniques. Analytical precision is the agreement between individual test portions taken from the same sample, for the same parameters, subjected to the same preparative and analytical techniques.

**Accuracy** – Accuracy of the measurement system is evaluated by use of various kinds of QA samples, including, but not limited to, certified standards, in-house standards, and performance evaluation samples.

**Representativeness** – Representativeness addresses the degree to which the data accurately and precisely represent a real characterization of the waste stream, parameter variation at a sampling point, sampling conditions, and the environmental condition at the time of sampling. The issue of representativeness is addressed for the following points.

- Based on the generating process, the waste stream, and its volume, an adequate number of sampling locations are selected.
- The representativeness of selected media has been defined accurately.

1  
2 • The sampling and analytical methodologies are appropriate.

3  
4 • The environmental conditions at the time of sampling are documented.

5  
6 **Completeness** – Completeness is the amount of usable data obtained from a measurement system  
7 compared to the total amount of data requested.

8  
9 **Comparability** – Comparability is the confidence with which one data set can be compared to another.  
10 This usually is accomplished by using standard methods.

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## 6.0 RE-EVALUATION OF WASTE PROFILES

The frequency to re-evaluate the waste profile and supporting data and documentation is each 12 months at a minimum or more often if the onsite generating unit/offsite generator has informed the TSD unit of a change in the waste generation process, or if the TSD unit has identified that the waste received at the TSD unit or the description on the manifest or transfer papers does not match the waste profile. If the onsite generating unit/offsite generator has informed the TSD unit of a change in the waste generation process, the waste re-enters the waste stream approval process described in Section 2.1.1. The TSD unit evaluates verification data against the waste profile to identify any waste streams for which a change in waste generation process is suspect. If a waste stream is suspect, that waste stream also will re-enter the approval process described in Section 2.1.1.

When a waste profile is re-evaluated, TSD unit personnel could request the organization generating the waste to do one of the following:

- Verify the current waste profile documentation is accurate
- Supply new waste profile documentation
- Submit a sample for parameter testing.

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## 7.0 SPECIAL PROCEDURAL REQUIREMENTS

This section discusses any special process requirements for receiving mixed waste at T Plant.

### 7.1 PROCEDURES FOR RECEIVING WASTE GENERATED ONSITE

In general, mixed waste received from onsite generating units is managed the same as waste received from offsite generators. Differences include, but are not limited to, the following: (1) physical and chemical screening frequencies for verification (minimum percentages of 5 percent for waste from onsite generating units and 10 percent for waste from offsite generators (note that chemical screening frequency depends on the physical screening frequency); (2) transfer/shipping documentation (Uniform Hazardous Waste Manifests are used for waste from offsite generators, and waste tracking forms are used for waste from onsite generating units); and (3) LDR documentation requirements (notification for waste from offsite generators and the information contained in the notice for waste from onsite generating units).

### 7.2 PROCEDURES FOR RECEIVING WASTE GENERATED OFFSITE

Waste received from offsite is handled in the same manner as mixed waste received from onsite except as denoted in Section 7.1.

### 7.3 PROCEDURES FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

This TSD unit accepts ignitable, reactive, or incompatible waste (refer to Section 1.2). The following precautions are taken before ignitable, reactive, or incompatible waste is accepted at this TSD unit.

- Pre-transfer/shipment review and/or chemical screening identifies whether the waste is ignitable, reactive, or incompatible.
- The TSD unit waste acceptance criteria identify storage requirements for ignitable, reactive, and incompatible waste, ensuring the waste is stored in a safe manner.

The types of prohibited waste are listed in Section 1.2.

### 7.4 PROVISIONS FOR COMPLYING WITH FEDERAL AND STATE LAND DISPOSAL RESTRICTION REQUIREMENTS

State-only and federal LDR requirements restrict the land disposal of certain types of waste subject to RCRA and RCW 70.105, *Hazardous Waste Management*, as amended. Waste managed on the Hanford Facility falls within the purview of these LDRs per 40 CFR 268 and WAC 173-303-140. Waste constituents that are subject to LDRs are identified in 40 CFR 268.40 and referenced by WAC 173-303-140. Waste must meet certain treatment standards, as specified in 40 CFR 268.40 and WAC 173-303-140, if the waste is to be land disposed.

Generators (as defined in the regulation) determine if LDRs apply to the waste based on knowledge or testing [40 CFR 268.7(a)]. Each waste is analyzed for those LDR constituents contained in the listed and characteristic waste numbers identified by the onsite generating unit/offsite generator if the knowledge of the onsite generating unit or offsite generator is not sufficient to make a determination. If the LDR waste

does not meet the applicable treatment standards, the onsite generating unit/offsite generator provides waste information with each transfer/shipment stating so in accordance with WAC 173-303-380(1)(j),-(k),-(l),-(m),-(n) or -(o). If the waste meets the standards, the onsite generating unit/offsite generator must send a certification that the waste meets the treatment standards.

#### 7.4.1 Waste Treatment

Waste is treated to meet LDR as specified in 40 CFR 268.40 and WAC 173-303-140 with the exception of TRU mixed waste. TRU mixed waste is treated to the applicable standards required by the Waste Isolation Pilot Plant or other TSD unit requirements. This TSD unit potentially can pre-treat certain waste before shipment to a permitted offsite facility that could perform full treatment of the specific waste to meet full LDR. Waste requiring treatment other than what this TSD unit can provide is repackaged, labeled, and transferred for storage within this TSD unit, or transferred/shipped to another onsite TSD unit or offsite TSD facility pending identification or development of an appropriate treatment.

LDR requirements apply to all mixed waste except a small class of state-only waste. When evaluating the treatability of certain characteristic waste, consideration is given to any additional underlying hazardous constituents that might be found in the waste. The treatment standards, for the most part, are concentration-based. If the constituent concentrations for the waste fall below those specified in 40 CFR 268.40 and/or 268.48 for underlying hazardous constituents and in WAC 173-303-140, the waste can be land disposed without being treated. If the concentrations exceed these limits, the waste must be treated before disposal.

Specific treatments performed within this TSD unit include deactivation, encapsulation, stabilization, and amalgamation.

Deactivation is used to remove the hazardous characteristics of the waste due to ignitability (D001), corrosivity (D002), solid corrosive acid (WSC2), and/or reactivity (D003). Treatment techniques include, but are not limited to, neutralization, absorption, cementing, controlled reaction with water, and macroencapsulation.

- Neutralization is the primary method of treatment for corrosive waste that has a pH less than or equal to 2.0 and/or greater than or equal to 12.5. Examples of bases that could be used as neutralizing agents include sodium hydroxide, calcium hydroxide, or calcium carbonate. Examples of acids that could be used to neutralize bases are hydrochloric acid and sulfuric acid.
- Absorption is the primary method of treatment for ignitable waste, which includes waste that is liquid and has a low total organic carbon content (less than 10 percent). Absorbent material that could be used includes polyacrylates, polypropylene, polymer type, superabsorbent polymer, cellulose, or other absorbent materials meeting various disposal requirements.
- Cementing or grouting is the primary method of treatment for ignitables, consisting of metal fines or other corrosive materials. These types of waste are deactivated by mixing and binding the waste with an inert cementitious material.
- Controlled reaction with water is the primary method of treatment for reactive materials, such as sodium metal. This process deactivates the material and allows for further disposition.
- Macroencapsulation with polyethylene plastic containers is the primary treatment for debris. For elemental lead, macroencapsulation is performed in accordance with Table 1 of 40 CFR 268.42.

Stabilization methods used at this TSD unit include cementing or grouting, sealing, and absorption. Particulates and/or liquid waste containing hazardous constituents could be cemented or grouted in this TSD unit to meet either RCRA LDR, Waste Isolation Pilot Plant waste acceptance criteria, and/or the disposal criteria of other onsite TSD units and/or offsite TSD facilities. These types of waste are stabilized by mixing and binding the waste with an inert material. The inert material generally used is Portland cement. When dealing with some waste streams, such as sludges that might contain an inconsistent or excess liquid content, absorbent could be added to the waste to provide a drier matrix to allow identification of the proper combination of ingredients to ensure a successful stabilization effort.

Amalgamation of liquid elemental mercury (D009) is achieved using inorganic reagents, such as copper, zinc, nickel, gold, and sulfur. The resultant matrix is a nonliquid, solid, or semi-solid visually inspected to verify compliance.

Treatment of state-only extremely hazardous waste (WT01, WP01, and WP03) is performed in accordance with RCW 70.105.050(2) and/or WAC 173-303-140(4)(a) as applicable.

Waste managed in this TSD unit is treated to meet either concentration-based treatment standards or technology-based standards. When dealing with underlying dangerous constituents or mixtures, both standards could apply, requiring a treatment train for ultimate compliance to LDR. In most cases, stabilization treatment is at the end of the treatment train. In some instances, as with the cementing process, treatability studies could be performed to ensure that when the waste is treated, LDR requirements are met.

Grab samples are collected on each batch of concentration-based treated waste to ensure that the treatment process was successful. Methods used to ensure compliance include visual inspection, pH, and toxicity characteristic leaching procedure. For specified technologies, the TSD unit operating record contains information to demonstrate the treatment process is well designed and well operated.

#### **7.4.2 Sampling and Analytical Methods**

Waste sampled and analyzed for the purpose of demonstrating compliance with LDR treatment standards must use SW-846 methods. It is recognized that radiological concerns might warrant modifications to the methods to ensure appropriate protection of personnel health and safety without impact to the method and sample integrity. Waste analyzed using SW-846 methods modified to address radiological protection concerns are considered acceptable provided applicable data quality objectives are met.

Samples of waste are transferred to the sample management area for packaging and transferred to an onsite laboratory or shipped offsite to a laboratory for analysis. Samples are collected and analyzed in accordance with SW-846 and as described in Section 4.0. Storage is provided for waste containers while waiting laboratory analytical results.

#### **7.4.3 Land Disposal Restriction Certification of Treatment**

When LDR treatment has been completed and analytical results (if applicable per 40 CFR 268.40 and WAC 173-303-140) have verified the LDR treatment is successful, certification of the LDR treatment is required. The certification statement is prepared by the TSD unit in accordance with 40 CFR 268.7. A copy of the certification is placed in the TSD unit operating record.

When a LDR waste does not meet the applicable treatment standards set forth in 40 CFR 268.40 and WAC 173-303-140 or exceeds the application prohibition levels set forth in 40 CFR 268.32 or

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1 Section 3004(d) of RCRA, this information is placed in the TSD unit operating record in accordance with  
2 WAC 173-303-380(1)(k),-(n),-(o).  
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## 8.0 RECORDKEEPING

Recordkeeping requirements applicable to this WAP are described in Hanford Facility RCRA Permit, Attachment 33, General Information Portion, Table 12-1 and within this WAP.

This TSD unit maintains the waste stream profile, supporting documentation, and any associated QA/QC data described in Section 2.0 of the WAP in accordance with the requirements in Hanford Facility RCRA Permit, Attachment 33, General Information Portion, Table 12-1.

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